STATE OF SOUTH CAROLINA)

(Caption of Case))

In the Matter of:)
Petition of the Office of Regulatory Staff to)
Establish Dockets to Consider Implementing)
the Requirements of 1251 (Net Metering and)
Additional Standards of the Energy Policy Act)
of 2005)

BEFORE THE
PUBLIC SERVICE COMMISSION
OF SOUTH CAROLINA

COVER SHEET

DOCKET
NUMBER: 2005 - 385 - E

(Please type or print)

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DOCKETING INFORMATION (Check all that apply)

☐ **Emergency Relief demanded in petition** ☐ **Request for item to be placed on Commission's Agenda expeditiously**

☐ **Other:**

INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Late-Filed Exhibit
- ☐ Letter
- ☐ Memorandum
- ☐ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☒ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☐ Report
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatio
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☐ Other:

BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 2005-385-E

In the Matter of: Petition of the Office of Regulatory Staff to Establish Dockets to Consider Implementing the Requirements of 1251 (Net Metering and Additional Standards of the Energy Policy Act of 2005	)	**RESPONSIVE TESTIMONY OF BARBARA G. YARBROUGH FOR DUKE ENERGY CAROLINAS**

Q. **PLEASE STATE YOUR NAME, ADDRESS AND POSITION WITH DUKE ENERGY CORPORATION.**

A. My name is Barbara G. Yarbrough. My business address is 526 South Church Street, Charlotte, North Carolina. I am Rates Director for Duke Energy Carolinas, LLC (referred to hereinafter as "Duke Energy Carolinas" or the "Company"). I have responsibility for assisting in the development, implementation and proper administration of the Company's rate schedules and service regulations, as well as administering the Commission's Rules and Regulations. I am also responsible for responding to customer inquiries including those directed to the South Carolina Office of Regulatory Staff.

Q. **HAVE YOU PREVIOUSLY FILED DIRECT TESTIMONY IN THIS DOCKET?**

A. Yes, I have.

Q. **WHAT IS THE PURPOSE OF YOUR RESPONSIVE TESTIMONY?**

A. The purpose of my responsive testimony is to address the concerns expressed by several intervenors regarding the facilities fees, demand charges, and designation of peak and off-peak hours contained in Duke Energy Carolinas' net metering tariff ("Rider NM") and flat rate tariff ("Rider SCG") proposed in this docket in response to Commission Order 2007-618, dated August 30, 2007 (the "Commission's Order"). Further, I will explain how the Company designed its flat rate tariff – Rider SCG – and how the charges under this option compare to the charges under Rider NM.

Q. PLEASE RESPOND TO WITNESS GREENLAW'S TESTIMONY REGARDING "REDUNDANT, ARBITRARY AND/OR PUNITIVE FEES."

A. A fundamental principle of utility rate-making is that the rates charged to its customers be based on cost of service. The fees and charges contained in Rider NM and Rider SCG are based on the Company's cost of service. Thus, the charges for Duke Energy Carolinas' net metering customers are neither redundant nor arbitrary or punitive. Ms. Greenlaw provides no basis for this statement, which is simply incorrect.

Q. PLEASE EXPLAIN WHY THE TIME-OF-USE RATE IS APPROPRIATE FOR NET METERING CUSTOMERS.

A. Duke Energy Carolinas' net metering tariff, Rider NM, was designed with several objectives in mind. First, it allowed the Company to utilize an existing cost-based tariff to allow the customer to offset load from his generator. Ms. Greenlaw suggests that customers be paid the "full retail rate" and Duke Energy Carolinas' net metering option under Rider NM does just that. Each kilowatt of capacity provided during the monthly peak period and each kilowatt hour generated by the customer are credited as the same rate the customer is charged. Secondly, the time-of-use tariff is the one that most appropriately reflects the costs of serving a net metering customer, especially a photovoltaic system, which provides the most value during peak hours. Customer-owned generator systems are not a consistent, reliable source of capacity; the benefit from such systems is generally the energy provided. A time-of-use rate appropriately values capacity and energy separately. Thirdly, because a time-of-use rate already requires a time of use meter, no

additional metering charges were included in the rate for the net metering customer under Rider NM.

Q. WITNESSES ODELL, GREENLAW AND SMITH ARGUE THAT THE COMPANY'S TARIFFS SHOULD NOT INCLUDE DEMAND CHARGES. PLEASE EXPLAIN WHY DEMAND CHARGES ARE APPROPRIATE.

A. Electric rates in their purest form would have three types of charges: (1) a customer charge that would recover all of the basic costs of providing service, (*e.g.* meter, meter reading, billing, payment, etc.); (2) a demand charge reflecting the fixed cost of generation, transmission and distribution capacity required to serve the customer; and (3) an energy charge based on the variable amount of energy used by the customer. Demand charges are not only appropriate, but are the most accurate way of collecting for the fixed cost of capacity required by the customer on an annual basis. Because small customer generators are offsetting their requirements from the utility, use of the demand charge (i) more accurately reduces the customer's bill when the generator truly offsets the need for capacity, and (ii) more accurately charges the customer for the appropriate capacity costs when the generator is not operating. The time-of-use rate provides an even greater degree of accuracy because charges (or credits) also vary according to the time of day and season that energy is produced and/or used. For customers using generators, time-of-use rates with a demand charge do a much better job of avoiding improper cross subsidies. Time-of-use rates do not charge more than standard rates; rather, they are designed to be revenue-neutral. Time-of-use rates with demand charges should be more attractive to residential customers than

time–of-use rates without demand charges. A reduction of 1 kilowatt during the summer peak hours of the month produces a savings of $6.41, plus energy savings when the usage for that period can be eliminated or shifted to lower price hours. Under a non time-of-use rate, the customer would have to completely eliminate approximately 80 kilowatt hours per month (roughly two (2) full days of energy usage), to achieve the same savings as reducing 1 kW during the on-peak period under a time-of-use rate. Kilowatt demand can often be reduced much more easily than reduction in energy, especially in light of the fact that the summer on-peak hours represent less than 20% of the total hours during a month.

Q. PLEASE RESPOND TO WITNESS GREENLAW'S CRITICISMS OF THE DIFFERENCES IN THE COMPANY'S PEAK HOURS IN ITS TIME-OF-USE TARIFFS AND THE TARIFF USED FOR PAYMENT OF EXCESS ENERGY UNDER THE FLAT RATE OPTION.

A. The peak hours on the time of use rate are aligned with the hours during the week, Monday through Friday, when demand for electricity is the highest; therefore, the benefits of reduction in energy usage from a customer-owned generator are credited accordingly. Duke Energy Carolinas filed a "flat rate" option – Rider SCG -- which like Rider NM, uses existing Commission-approved rate schedules. Under Rider SCG, the standard kilowatt hour rate applies for the net energy purchased from the Company by the customer, meaning the customer is credited at the full retail rate, even if there is no reduction in capacity required by the utility to serve the customer. In the Commission's Order, which required the utilities to file a flat rate option, the Commission ordered:

> Specifically, the tariff should be designed to allow residential and small commercial customers to pay the utility's existing flat kWh rate for any power purchased from the utility, while receiving a credit for any excess generation provided to the utility on a peak/off peak or real time basis. This tariff should be designed to eliminate, as much as possible, any cross-subsidization of customers. Order No. 2007-618, at 3.

To comply with this order, the Company relied on Schedule PP, a Commission-approved tariff, to compensate the customer for excess energy based on the Company's avoided cost in exactly the same way a large customer would be compensated for excess energy under the Company's approved parallel generation Schedule PG, which also pays for excess energy using the rates in Schedule PP. The on-peak hours under Schedule PP are longer than those under the time-of-use rate, but this actually benefits the photovoltaic customer because the customer is paid higher on-peak rates over more hours of the day.

Q. CAN YOU EXPLAIN WHY THE BASIC FACILITIES CHARGES UNDER RIDER NM AND RIDER SCG ARE DIFFERENT?

A. Because the $11.59 Basic Facilities Charge under a time-of-use rate already reflects the cost of a time-of-use meter, no additional meter cost was included with Rider NM. There are, however, additional administrative costs required to manage net metering accounts which must measure excess energy. To help offset some of the additional administrative costs for net metering customers and minimize the subsidy, Rider NM provides that excess kilowatt hours not used by the customer during the year are returned to the Company annually.

Q. HOW DID DUKE ENERGY CAROLINAS DESIGN ITS FLAT RATE TARIFF?

A. Duke Energy Carolinas designed its flat rate tariff option to be consistent with (i) the directives in the Commission's Order, and (ii) the approach taken by the Company in the design of Rider NM. Duke Energy Carolinas' proposal uses existing standard rates approved by the Commission in conjunction with a new Rider SCG. The standard residential rates have a small Basic Facilities Charge of $6.16, which has not been adjusted in over 20 years. Because this Basic Facilities Charge does not include the cost of a meter, and because the Commission's Order required that the flat rate option pay customers for excess "on a peak/off peak or real time basis," the Company included a Supplemental Basic Facilities Charge to cover the incremental metering costs for a time-of use meter that can also measure the flow of energy in both directions. In addition, because Rider SCG allows the small customer generator to offset usage, kilowatt hour for kilowatt hour, at the full retail rate of approximately 8 cents/kWh, the Company's recovery of fixed costs is eroded. As a result, the Company included a small Standby Charge to be compliant with the Commission's Order that the flat rate option "eliminate, as much as possible, any cross-subsidization of customers."

Although it would be appropriate to do so, the flat rate option proposed by Duke Energy Carolinas does not charge customers for the significantly higher administrative costs caused by these installations. The higher administrative costs were also not included in Rider NM. One example of increased administrative costs under the flat rate option is the costs the Company incurs because of its inability to use more cost-effective "drive-by" meter reading capability for these customers.

Q. HOW DO THE CHARGES UNDER RIDER NM AND RIDER SCG COMPARE?

A. A close examination shows that the basic costs are comparable under either of the rate options. Under the Rider SCG option, the Basic Facilities Charge and Standby Cost for a typical 2 kW generator is $11.81 compared to $11.59 under the Rider NM option. Ms. Greenlaw states that "the utilities charge more for basic facilities charges although the costs of the use of facilities by customer generators have not been studied." Greenlaw Testimony, at 2, lines 50-51. Although it is true that Duke Energy Carolinas has not studied the actual costs of serving customers with generator systems, we are confident that the incremental billing and administration of these accounts alone would justify a higher Basic Facilities Charge than has been proposed in this proceeding.

Q. PLEASE RESPOND TO MS. GREENLAW'S STATEMENT THAT THE CUSTOMER GENERATOR NEEDS TO BE FULLY CREDITED.

A. As I have previously indicated, both the designs of Rider NM and Rider SCG more than fully credit small customer generators for the value of the energy delivered to the system. Yarbrough Responsive Exhibit No. 1 shows that under Rider NM or Rider SCG, the customer receives the full retail rate for energy, or energy and capacity, provided by the customer generator, even though Duke Energy Carolinas does not avoid any investment in generation, transmission or distribution capability. Under Rider SCG, excess energy is paid to the customer at the Schedule PP avoided cost on-peak and off-peak rates, comparable to the on-peak and off-peak values for excess energy provided using the time-of-use rate

with Rider NM -- both in the range of approximately 4-5 cents per kilowatt hour. Both rate options, while causing some cross-subsidization, are appropriate and Duke Energy Carolinas would be very concerned about imposing even more of the incremental costs on non-participating customer, especially those low-income customers who do not have the resources to purchase costly photovoltaic systems. Duke Energy Carolinas believes that its net metering rate offers provide benefits and savings to net metering customers. Further, while these rate schedules do not fully eliminate cross-subsidization, they are designed to minimize it in accordance with the Commission's Order.

Q. THE INTERVENORS EXPRESS CONCERN ABOUT CUSTOMERS' ABILITY TO ACHIEVE SAVINGS FOR THE BENEFITS THEY PROVIDE FROM CUSTOMER-OWNED GENERATION. WHAT SAVINGS CAN A CUSTOMER ACHIEVE UNDER DUKE ENERGY CAROLINAS' RIDER NM OR RIDER SCG?

A. Duke Energy Carolinas agrees with Mr. Odell's testimony that savings achieved by customer-generators, particularly solar or wind generator systems, are difficult to predict because the output is dependent on the forces of nature and the operation of the system. However, savings are available, and in comparable amounts, under either rate option.

Q. HAVE YOU PREPARED AN EXHIBIT TO ILLUSTRATE THE POTENTIAL FOR SAVINGS?

A. Yes. I used actual billing data from a North Carolina customer to create the billing example for Rider SCG, and using the same data, with reasonable

assumptions about on-peak and off-peak usage, created a billing example for Rider NM. Yarbrough Responsive Exhibit No. 2 shows a customer whose monthly electrical usage requirement was 1071 kilowatt hours, and the customer's 2 kW photovoltaic system generated 263 kilowatt hours. The customer's bill, including the supplemental Basic Facilities Charge and Standby Charge was $70.63, a savings of $14.53, 17% less than he would have paid for the entire 1071 kilowatt hours used. In this example, no excess energy was assumed, but excess energy would increase the savings. This exhibit also shows a bill calculation using 1071 kWh under Rider NM, assuming 20% of the kilowatt hours were used on-peak and 80% off-peak. The example also assumed that the customer's on-peak demand would have been 7 kW without a PV system, but was reduced by 1.3 kW due to the operation of the PV system. Because of the summer/winter differential in the rates, a weighed average monthly cost is estimated to be $70.94, which represents less than a $1.00 difference for the same customer under the flat rate option with Rider SCG. The Rider NM customer would have saved an average of $17.64 per month, approximately 20% less than Schedule RT, the standard residential rate schedule. Please note that in both of these examples the customers are getting the full retail rate for the output of the generator. If there is excess, under either option, the customer receives the benefit of the excess at approximately 4-5 cents/kWh, which is appropriate based on the Company's avoided cost. Obviously customers with larger systems can produce more energy and achieve greater savings. Although a typical small residential system is 2 kW,

we have several residential customers in North Carolina with systems ranging from 4 to 10 kW.

Q. DOES THIS CONCLUDE YOUR PRE-FILED RESPONSIVE TESTIMONY?

A. Yes.

YARBROUGH RESPONSIVE EXHIBIT 1

DUKE ENERGY CAROLINAS

RIDER SCG AND RIDER NM RATE OPTIONS FOR CUSTOMERS WITH SMALL GENERATORS WHO MEET THE INTERCONNECT STANDARD

SCHEDULE RS (SC), Category 2, with Small Customer Generator Rider SCG

RATE	CHARGES	All Months
RS2	Basic Facilities Charge	$6.16
SCG	Supplemental BFC	$3.75
SCG	Standby Charge	$.95 per kW of generator
		All Months
RS2	First 1000 kWh per month	7.2715 cents/kWh
	Over 1000 kWh per month	8.7605 cents/kWh

RATE	CREDITS	
	When customer load exceeds generator load	All Months
RS2	First 1000 kWh per month	(7.2715 cents/kWh)
	Over 1000 kWh per month	(8.7605 cents/kWh)
	When generator load exceeds customer load	All Months
PP	On-Peak Energy Credit	(5.44 cents/kWh)
PP	Off-Peak Energy Credit	(3.90 cents/kWh)

Note 1: Credits for excess energy, if any will further reduce energy charges

Note 2: Rider SCG can be used in conjunction with RS, RE, ES, or RT. The majority of Duke Energy residential customers are served on RS, category 2 which is used in this example.

SCHEDULE RT(SC) With Net Metering Rider NM

RATE	CHARGES	All Months
RT	Basic Facilities Charge	$11.59 per month

		June-Sept	Oct-May
RT	On-Peak Demand Charge	$6.41 per kW	$3.21 per kW

		All Months
RT	On-Peak Energy Charge	5.1767 cents/kWh
	Off-Peak Energy Charge	4.1969 cents/kWh

RATE	CREDITS	June-Sept	Oct-May
RT	On-Peak Demand Credit	($6.41 per kW)	($3.21 per kW)

		All Months
RT	On-Peak Energy Credit	(5.1767 cents/kWh)
RT	Off-Peak Energy Credit	(4.1969 cents/kWh)

Note 1: If the net energy component is a credit, the credit may be carried forward and applied to following month. Accumulated energy credits, if any, are donated to the Company June 1 each year.

DUKE ENERGY CAROLINAS
SAMPLE BILLS UNDER RIDER SCG AND RIDER NM RATE OPTIONS

Customer energy requirements are 1071 kwh, peak demand 7 kW, reduced to 5.7 kW with 2 kW PV system, 20% of kWh are used on-peak, and PV system generates 263 kwh

SCHEDULE RS (SC), Category 2, with Small Customer Generator Rider SCG

RS2	Basic Facilities Charge	$	6.16		
SCG	Supplemental Basic Facilities Charge	$	3.75		
SCG	Standby Charge (2 kW system)	$	1.90		
	Total Basic Facilities and Standby Charge			$	11.81
	Energy Charges for 1071 kWh				
RS2	First 1000 kWh		1000	$	72.71500
	Over 1000 kWh		71	$	6.21996
	Energy Credits for 263 kWh from PV system.				
RS2	192 kWh at first 1000 kWH rate		192	$	(13.96128)
	71 kWh at over 1000 kWh rate		71	$	(6.2200)
	SCHEDULE RS2 WITH SCG				
	MONTHLY BILL			$	70.56

SCHEDULE RT(SC) With Net Metering Rider NM

			June-Sept		Oct - May
RT	Basic Facilities Charge	$	11.59	$	11.59
RT	On-Peak Demand Charge (assume 7 kW without PV)	$	44.870	$	22.47
RT	On-Peak Demand Credit (assume 5.7 kW with PV -- 1.3 KW reduction)	$	(8.33300)	$	(4.1730)
RT	Energy Charges for 1071 kWh (20% on-peak, 80% off-peak)				
	On-peak energy 214	$	11.07814	$	11.0781
	Off-peak energy 857	$	35.96743	$	35.9674
RT	Energy Credits for 263 kWh from PV system				
	On-peak energy credit 106	$	(5.48730)	$	(5.48730)
	Off-peak energy credit 157	$	(6.58913)	$	(6.58913)
	SCHEDULE RT WITH RIDER NM	$	83.10	$	64.86
	WEIGHTED AVERAGE MONTHLY BILL (SUMMER/WINTER)			$	70.94

COMPARISON

	SCHEDULE RS2		
	NORMAL MONTHLY BILL RS2	$	85.09
	MONTHLY BILL WITH RS2 WITH SCG	$	70.56
	MONTHLY SAVINGS	$	14.53
	% SAVINGS		17%

COMPARISON

		June-Sept		Oct - May
	SCHEDULE RT	$	103.51	$ 81.11
	AVERAGE MONTHLY BILL RT			$ 88.57
	AVERAGE MONTHLY BILL RT WITH NM			$ 70.94
	AVERAGE MONTHLY SAVINGS			$ 17.63
	% SAVINGS			20%

CERTIFICATE OF SERVICE

I, Catherine E. Heigel, hereby certify that I have placed copies of the Responsive Testimony of Barbara G. Yarbrough for Duke Energy Carolinas, LLC in the U.S. mail on this date to the parties of record at the addresses shown below, with sufficient postage attached:

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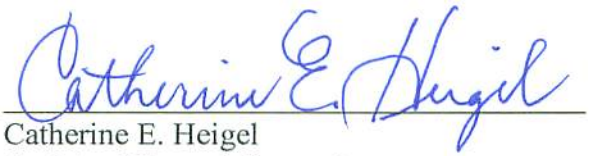
This the 11th day of April, 2008.



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